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numerous new and well chosen cuts is refreshing. Unquestionably the book is a valuable addition to elementary texts in botany and should find a wide field of usefulness in the hands of trained instructors.—LEROY H. HARVEY.

MINOR NOTICES

Nature sketches.—The chief scientific value of HANCOCK'S *Nature Sketches*[4] is the large number of accurate and original observations upon insects and other animals in relation to their natural environments. The first chapter contains an unusually clear and simple discussion of problems and theories of evolution. Insect and bird pollination, and the relations of animals to flowers are discussed and beautifully and accurately illustrated, especially in the second chapter, by drawings, photographs, and colored plates of examples from temperate America. The adaptations of insects, birds, and flowers are discussed, and the author appears to be of the opinion that everything is useful. It is unfortunate that the idea of adaptation should be introduced without qualification into a popular work at a time when many botanists and zoologists regard it as doubtful. The chapters on "Animal behavior" and "Ecology" should have had less comprehensive titles. Though somewhat confused with faunistic geography, the first five pages of the chapter on ecology are devoted to a good summary of some of the important facts of genetic ecology. The lists of plant and animal habitats at the end of the book give the habitat preferences of a number of Orthoptera, but contain few elements of progress in ecological classification. The current classification has not been followed.[5] In addition to its scientific value, the book is a good introduction to many aspects of natural history for the lay reader.—V. E. SHELFORD.

Popular manuals.—The nature and purpose of the very interesting *Cambridge manuals of science and literature* have been noticed in this journal.[6] At that time five volumes dealing with plants had been published, and now two additional volumes have appeared: *Links with the past in the plant world*, by A. C. SEWARD (pp. 142); *Life in the sea*, by J. JOHNSTONE (pp. 150). The volumes are sold for one shilling each, and form for the general reader a readable résumé of current scientific knowledge. The titles of the eight chapters of Professor SEWARD'S volume will give a better conception of the contents than does the general title. They are as follows: "Longevity of trees, etc."; "The geographical distribution of plants"; "The geological record"; "Preservation of plants as fossils"; "Ferns, their distribution and antiquity"; "The redwood and mammoth trees of California"; "The Araucaria family";

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[4] HANCOCK, JOSEPH L., Nature sketches in temperate America. 8vo. xviii+451. *pls. 12. figs. 215.* Chicago: A. C. McClurg & Co. 1911. $2.75.

[5] PEARSE, in Science **34**:37. 1912, is mistaken in this matter.

[6] BOT. GAZ. **52**:234. 1911.

"The maiden hair tree." The American publisher is G. P. Putnam's Sons of New York.—J. M. C.

North American Flora.[7]—Vol. VII, part 3, continues the treatment of the Uredinales and contains the Aecidiaceae from *Prospodium* to *Dichaeoma* by Joseph Charles Arthur, the text for the genus *Gymnosporangium* being contributed by Frank Dunn Kern. One new genus (*Argomyces*) is proposed, which has a geographical distribution from New Mexico and Texas through Mexico and the West Indies to South America, and is represented at present by four known species. Further new species are characterized in the following genera: *Earlea* (1), *Kuehneola* (1), *Spirechina* (1), and *Xenodochus* (1).—J. M. Greenman.

NOTES FOR STUDENTS

Variation curves.—Several years ago papers dealing with variation in the number of parts of flowers, flower heads, inflorescences, etc., were of frequent appearance. As the novelty of the method disappeared, the number of contributors to the knowledge of such variations has decreased, but, as is usually true in such cases, the value of the contributions has correspondingly improved. Several recent studies in this field are of exceptional interest.

Vogler[8] gives a large number of counts of ray flowers in *Chrysanthemum*, *Boltonia*, and *Senecio*. In *Chrysanthemum Parthenium* he found a curve having the mode on 21 when the plants were grown on well-manured soil, and on 13 when grown on infertile soil, the curves being strongly skew in each case toward an intermediate point, the mean values lying between 14 and 19. These results agree essentially, therefore, with those of Klebs[9] on *Sedum spectabile*. In *Boltonia latisquama* the ray flowers have a wide range of variation (39–81), with the summit of the curve near 55. Three different plants were separately counted in three successive years, and although the different seasons differed considerably, there was no corresponding change in the number of ray flowers. One of these plants had each year the mean number approximately 57, another approximately 54. These permanent differences are probably not to be attributed to genotypic differences in the plants, however, as they originated from a common stock by vegetative division. In *Senecio alpinus* a count of over 3000 heads from two different localities in three different years gave in every case a nearly monomodal curve with the mode on 19, thus convincing the author of the limitations of Ludwig's law that the maxima of such

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[7] North American flora. Vol. VII, part 3, pp. 161–268. The New York Botanical Garden. April 15, 1912.

[8] Vogler, P., Variation der Anzahl der Strahlblüten bei einigen Kompositen. Beih. Bot. Centralbl. **25**:387–396. 1910.

[9] Klebs, G., Studien über Variation. Arch. Entwick.-Mech. Organ. **24**:29–113. 1907.